What is claimed is:

1. A method of filling one or more features on a substrate, comprising:

depositing a barrier layer on the substrate, the barrier layer being formed from purified pentakis(dimethylamido)tantalum having less than about 5 ppm impurities;

depositing a seed layer over the barrier layer; and

depositing a conductive layer over the seed layer.

2. The method of claim 1, further comprising subliming pentakis(dimethylamido)tantalum to remove at least a portion of tantalum oxo amides and form the purified pentakis(dimethylamido)tantalum.

3. The method of claim 1, wherein the conductive layer comprises copper.

4. The method of claim 1, wherein the barrier layer is formed by atomic layer deposition.

5. The method of claim 1, wherein the impurities are selected from the group consisting of chlorine, lithium, iron, fluorine, bromine, iodine, and combinations thereof.

6. The method of claim 1, wherein depositing a barrier layer from purified pentakis(dimethylamido)tantalum results in a conductive layer having fewer defects than a conductive layer formed over a barrier layer formed from unpurified pentakis(dimethylamido)tantalum.

7. A method of depositing a tantalum nitride barrier layer on a substrate, comprising:

introducing purified pentakis(dimethylamido)tantalum to a processing chamber having a substrate disposed therein to form a tantalum containing layer on the substrate, the purified pentakis(dimethylamido)tantalum having about 5 ppm or less of impurities; and

introducing a nitrogen containing compound to the processing chamber to form a nitrogen containing layer on the substrate.

8. The method of claim 7, wherein the substrate has a temperature of from about 20 °C to about 500 °C.

9. The method of claim 7, wherein the processing chamber has a pressure of about 100 torr or less.

10. The method of claim 7, wherein the impurities are selected from the group consisting essentially of chlorine, lithium, iron, fluorine, bromine, iodine, and combinations thereof.

11. The method of claim 7, wherein the nitrogen containing compound comprises ammonia gas.

12. The method of claim 7, wherein the nitrogen containing compound is selected from the group consisting of ammonia, hydrazine, dimethyl hydrazine, t-butylhydrazine, phenylhydrazine, 2,2-azoisobutane, ethylazide, derivatives thereof, and combinations thereof.

13. The method of claim 7, wherein the barrier layer is formed by atomic layer deposition.

14. The method of claim 7, wherein the temperature of the substrate is selected so that 50% or more of the barrier layer deposition is by chemisorption.

15. The method of claim 7, wherein the purified pentakis(dimethylamido)tantalum is sublimed prior to introduction into the processing chamber.

16. The method of claim 7, further comprising removing at least a portion of the pentakis(dimethylamido)tantalum upon formation of the tantalum containing layer on the substrate.

17. A purified pentakis(dimethylamido) tantalum having about 5 ppm or less of

impurities.

18. The purified pentakis(dimethylamido) tantalum of claim 17, wherein the impurities are selected from the group consisting of tantalum oxo amides, chlorine, lithium, iron, fluorine, bromine, iodine, and combinations thereof.

19. The purified pentakis(dimethylamido) tantalum of claim 18, wherein the purified pentakis(dimethylamido) tantalum is sublimed to reduce the concentration of tantalum oxo amides therein.

20. Apparatus for generating a precursor for a semiconductor processing system, comprising:

a canister having a sidewall, a top portion and a bottom portion, wherein the canister defines an interior volume having an upper region and a lower region; and

a heater surrounding the canister, wherein the heater creates a temperature gradient between the upper region and the lower region.

21. The apparatus of claim 20, wherein the temperature gradient ranges from about 5 degrees Celsius to about 15 degrees Celsius.

22. The apparatus of claim 20, wherein the lower region has a lower temperature than the upper region.

23. The apparatus of claim 22, wherein the lower region has a temperature of about 5 degrees to about 15 degrees Celsius lower than the upper region.

24. The apparatus of claim 20, wherein the heater is disposed proximate the sidewall of the canister.

25. The apparatus of claim 20, wherein the heater is disposed around an outside portion of the canister.

26. The apparatus of claim 25, wherein the heater disposed around the outside portion of the canister is configured to generate more heat in the upper region of the canister.

27. The apparatus of claim 20, further comprising a cooling plate disposed proximate the bottom portion of the canister.

28. The apparatus of claim 20, wherein the canister comprises a heat transfer medium connecting the upper region to the lower region.

29. The apparatus of claim 28, wherein the heat transfer medium is at least one baffle extending from the top portion to the lower region.

30. The apparatus of claim 20, further comprising at least one silo extending from the bottom portion of the canister to the upper region.

31. The apparatus of claim 30, wherein the at least one silo is at least one of a post and a fin.

32. The apparatus of claim 20, further comprising:

a precursor material at least partially filling the lower region of the canister; and

a plurality of solid particles intermixed with the precursor material, wherein the solid particles are non-reactive with the precursor material, have a negligible vapor pressure relative to the precursor material, are insoluble with the precursor material, and configured to transfer heat from the sidewall of the canister.

33. The apparatus of claim 32, further comprising:

a precursor material at least partially filling the lower region of the canister; and

at least one silo extending from the bottom portion of the canister to the upper region.

34. The apparatus of claim 33, wherein at least one silo is configured to reduce the temperature gradient inside the precursor material.

35. Apparatus for generating a precursor for a semiconductor processing system, comprising:

a canister defining an interior volume having an upper region and a lower region;

a precursor material at least partially filling the lower region of the canister; and

a gas flow inlet tube adapted to inject a carrier gas into the canister in a direction away from the precursor materials.

36. The apparatus of claim 35, wherein the gas flow inlet tube is adapted to create a non-linear flow of gas into the upper region of the canister.

37. The apparatus of claim 36, wherein the linear flow is adapted to create an increased saturation level of the gas in the upper region of the canister.

38. The apparatus of claim 35, wherein the gas flow inlet tube extends from the upper region of the canister to a lower region of the canister.

39. The apparatus of claim 38, wherein the gas flow inlet tube is adapted to provide a first flow of gas into the upper region of the canister.

40. The apparatus of claim 39, wherein the gas flow inlet tube is adapted to provide a second flow of gas to the lower region of the canister.

41. The apparatus of claim 38, wherein the gas flow inlet tube comprises a restriction.

42. The apparatus of claim 41, wherein the gas flow outlet tube comprises at least one opening anterior to the restriction.

43. The apparatus of claim 42, wherein the opening is adapted to provide a non-linear flow of gas into the upper region of the canister.

44. The apparatus of claim 40, wherein the second flow of gas to the lower region is adapted to maintain a suspension of the precursor materials.

45. The apparatus of claim 40, wherein the second flow of gas is adapted to maintain an overall gas flow volume.